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7 Number of Pages (including this page)

Date:	February 5, 2007
To:	Examiner Vu, David
Location:	United States Patent and Trademark Office
Fax No.:	1 (571) 273-8300 Centralized Facsimile
From:	Larry G. Brown
Docket No.	CE11821JME – Goudarzi

Confirmation No.: 1459

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MESSAGE:

In connection with the above-identified Patent Application, please find attached herewith the following documents:

- Pre-Appeal Brief Request for Review; and
- A five (5) page Pre-Appeal Brief.

PLEASE DELIVER THESE PAPERS TO:

EXAMINER:	**Vu, David**
GROUP ART UNIT:	2818
SERIAL NO.:	10/678,489
FILED:	October 3, 2003
INVENTOR:	VAHID GOUDARZI

CERTIFICATE OF FAX TRANSMITTAL

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PRE-APPEAL BRIEF REQUEST FOR REVIEW	Docket Number (Optional) CE11821JME

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 [(37 CFR 1.8(a)].

on: February 5, 2007

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Larry G. Brown
Typed or printed name

Application Number 10/678,489	Filed October 3, 2003
First Named Inventor Vahid Goudarzi	
Art Unit 2818	Examiner Vu, David

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheets(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☒ attorney or agent of record.
Registraton number ______

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34: ______

Signature

Larry G. Brown
Typed or printed name

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Telephone number

February 5, 2007
Date

NOTE: Signatures of all the inventors or assignees or record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, se below*

☐ *Total of 1 forms are submitted.

(SB/33 (07-05))

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Application S/N 10/678,489
Pre-Appeal Brief Dated: February 5, 2007
Response to Office Action dated: August 3, 2006

CE11821JME

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S):	Vahid Goudarzi	GROUP ART UNIT:	2818
APPLN. NO.:	10/678,489	EXAMINER:	Vu, David
FILED:	October 3, 2003	Confirmation No.	1459
TITLE:	METHOD AND ARRANGEMENT FOR REDUCED THERMAL STRESS BETWEEN SUBSTRATES		

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Date:	February 5, 2007
Signature: Typed or Printed Name:	Larry G. Brown

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop: AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants request review of the Office Action mailed August 3, 2006 concerning the above-identified application. Although not a response to a final office action, Applicants note that the claims here have been rejected twice (see Final Office Action of February 22, 2006 and Office Action of August 3, 2006), and as such, this request complies with 37 C.F.R. 41.31(a). Moreover, this request is in furtherance of the Notice of Appeal filed on February 5, 2007. Claims 7-20 remain pending in the application, a copy of which can be found in Applicants' Amendment of May 30, 2006.

Independent Claim 7

For a brief description of the Degani, Wood and Schwiebert references, please refer to Applicants' Amendment of May 30, 2006, pages 11-13. Neither Degani nor

Wood show, teach, illustrate or even suggest solder of a first composition in a first area between the first substrate and the second substrate and solder of a second composition in a second area between the first and second substrates, which is separate from the first area, such that the different solders are vertically separated.

In attempting to describe how Degani reads on the present invention, the Examiner has referred to the solder bumps (12) of Degani as solder of both a first and second composition (see paragraph 2 of the Office Action of August 3, 2006). Such an interpretation of Degani is simply incorrect. In particular, one of ordinary skill in the art would appreciate that by reciting the terms "first" and "second" when referring to "composition" in claim 7, the claimed invention makes use of different solder compositions between the substrates. The specification clearly explains this feature (see paragraph 0013) and to hold that a first composition and a second composition are identical goes against the clear understanding of these words. In fact, the Examiner appears to implicitly agree with this interpretation, as the Examiner refers to a first material of the Wood reference - DDC/PCB - and a second material of the Wood reference - ceramic (see paragraph 3 of the Office Action of August 3, 2006). That is, the Examiner has taken a course here in which the interpretation of the modifiers "first" and "second" is limited to differentiation.

The argument above also applies to the Examiner's reading of the Wood reference. Specifically, the Examiner refers to the solder bumps (12) and bumped electrodes (96) of Wood as both solder of a first composition and solder of a second composition (see paragraph 3 of the Office Action of August 3, 2006). Although the solder bumps (12) and the bumped electrodes (96) are comprised of different solder alloys (see col. 9, lines 8-11), the composition of the union of these two solder alloys is the same throughout the module (see FIGs. 11A-11C). That is, the bonded connections that are formed in Wood are similar in composition (though consisting of different alloys) over the entire area of the module; bonded connections of compositions that are different from and in areas separate from the uniform bonded connections shown in FIGs. 11A-11C and are not described in Wood.

It is also important to note that both Degani and Wood recite suitable examples of the compositions of solder alloys (see Degani, col. 6, line 15 to col. 7, line 3 and Wood, col. 6, lines 32 – 36 and col. 9, lines 11-14). Thus, at the time of the invention, the inventors of both references were clearly aware of several solder compositions. Even so, however, there is no evidence that either reference contemplates the use of solder of first and second compositions in separate areas such that the compositions are vertically separated.

Also, Degani and Wood do not disclose, teach, illustrate or suggest the concept of having both the solder of the first composition and the solder of the second composition in a collapsed state. At best, Wood shows bumped electrodes in a collapsed state (see FIG. 11C), but the "solder bumps (12M) have a structural rigidity that prevents collapse of the die (10M) onto the supporting substrate." (see col. 10, lines 4-6). In addition, one of the solders in Schwiebert is a stand-off bump, which maintains its structural integrity throughout the reflow process and does not collapse. As a result, the stand-off bumps that reside between the two substrates are not in a collapsed state (see FIG. 6C).

In contrast with these prior art references, the different solders in the present invention are in a collapsed state in the final assembly. Because they were allowed to liquefy during the reflow process, the final assembly that includes the collapsed solders of the present invention will be lower in height than in Degani, Wood or Schwiebert, which is important in view of certain electronic devices becoming smaller and smaller. In addition, the collapsed solder of the present invention results in a final assembly that has a higher structural integrity than that in these prior art references.

In paragraph 8 of the Office Action of August 3, 2006, the Examiner argues that ". . . the process of reflowing the solder of the first composition and the second composition does not structurally distinguish the claimed invention over Degani, Wood and Schwiebert." Applicants submit that claim 7 does not attempt to ensnare within its scope the process of reflowing solder. The claim specifically recites that the solder of the first and second compositions is in a collapsed state. The noun "state," as one of skill in the art would appreciate, refers to the condition of the first and second compositions. One of skill in the art would also understand that the adjective "collapsed" further describes the condition of these compositions as having lost their structural integrity. Thus, claim 7 does not attempt to claim the actual process of reflowing solder; rather, claim 7 contains a limitation that describes the *structure* of the compositions once the reflow process has been completed.

Dependent Claims 18 and 19

In reference to claims 18 and 19, neither Degani, Wood nor Schwiebert disclose, teach, illustrate or suggest the concept of solder of a first composition, which is in a substantially centrally-located area of the first substrate or the second substrate, having

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a higher melting point than solder of a second composition, which is in a substantially peripherally-located area about the centrally-located area. In fact, Schwiebert teaches the exact opposite, as it calls for the stand-off bumps 610, which are made of a material that does not melt at the desired processing temperature (see col. 11, lines 46-47), to be positioned on the periphery of the substrate (see FIGs. 6A-6C). The present inventive concept, as described in the present invention, allows for a more structurally sound assembly.

Conclusion

In view of the above, Applicants contend that the claims are patentable over the cited prior art references. Reconsideration and withdrawal of the rejection of the claims is respectfully requested. Passing of this case is now believed to be in order, and a Notice of Allowance is earnestly solicited.

The Commissioner is hereby authorized to charge any necessary fee, or credit any overpayment, to Motorola, Inc. Deposit Account No. 50-2117.

Respectfully submitted,

By: ______________________
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